

WHEN SHOULD YOU CUT BACK? USING WATER SUPPLY FORECASTS AND WATER SHORTAGE TRIGGERS TO MANAGE DROUGHTS

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The City of Raleigh, NC is one of the fastest growing cities in the US, and like many growing cities in the southeast, is located in a region subject to increasing water scarcity. This presentation describes the evolution of Raleigh's drought preparedness over the last decade. Following the 2007-08 drought, the NC legislature passed a statute requiring each utility to prepare and submit a Water Shortage Response Plan (WSRP). The law stipulates that each utility's WSRP be set up with quantifiable triggers defining the conditions for implementation. Concurrent to these events, the NC Division of Water Resources (DWR) developed sophisticated water basin models that provide stakeholders like Raleigh with new planning and forecasting tools. When the City's WSRP was put into practice over 3 consecutive dry years from 2010-2012 it became evident that the conservation triggers in the WSRP were sub-optimal. The short-term solution was to generate a water supply forecast with DWR's basin model that better informed the decision to enact mandatory conservation measures. The longer-term solution was to improve the drought triggers in the WSRP. Effective drought response triggers facilitate a utility's ability to manage emerging droughts promptly while simultaneously minimizing false alerts. False alerts (mandating conservation when unnecessary) aggravate customers, erode conservation compliance during future droughts, and disrupt the utility's revenue stream. Creating effective triggering mechanisms for a WSRP requires an understanding of the dynamics that distinguish normal hydrologic cycles from droughts as well as the demand reduction achievable at each WSRP stage. By incorporating this information in the basin models, a new set of triggers was developed that are expected to reduce the frequency of WSRP activation by 40-50% without increasing the risk of exhausting the City's water supply during the worst droughts on record.

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